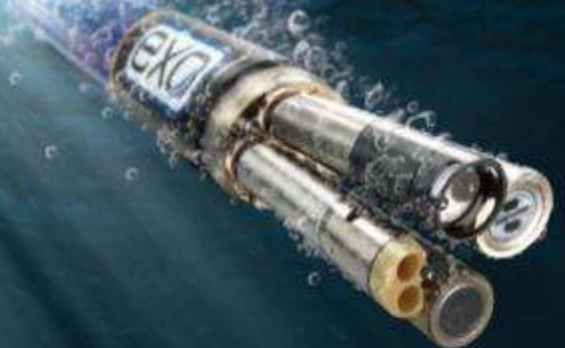




breaking the SONDE barrier

Detecting Algae Before the Bloom

Kyle Kaminski & Chris Hess
YSI Incorporated



Detecting Algae Before the Bloom



Nutrient Sources (agricultural runoff, storm water, combined sewage) spur the growth of several algae types.

Blue Green Algae serves as the biggest threat:

- Human health
- Aquatic species
- Recreation
- Industry

Sonde Applications

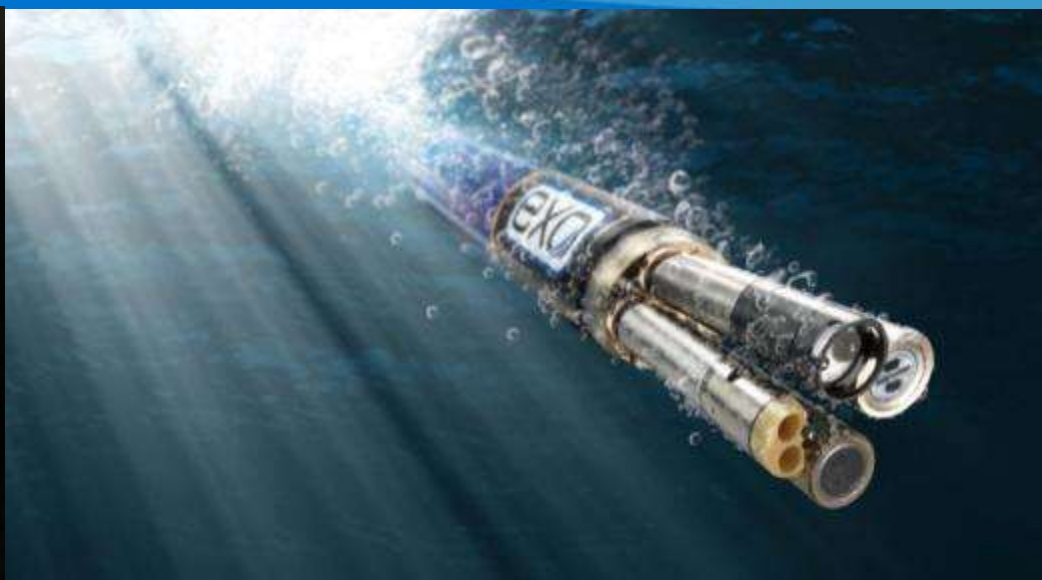




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EXO Overview

The Stronger, Faster, Smarter Monitoring Platform

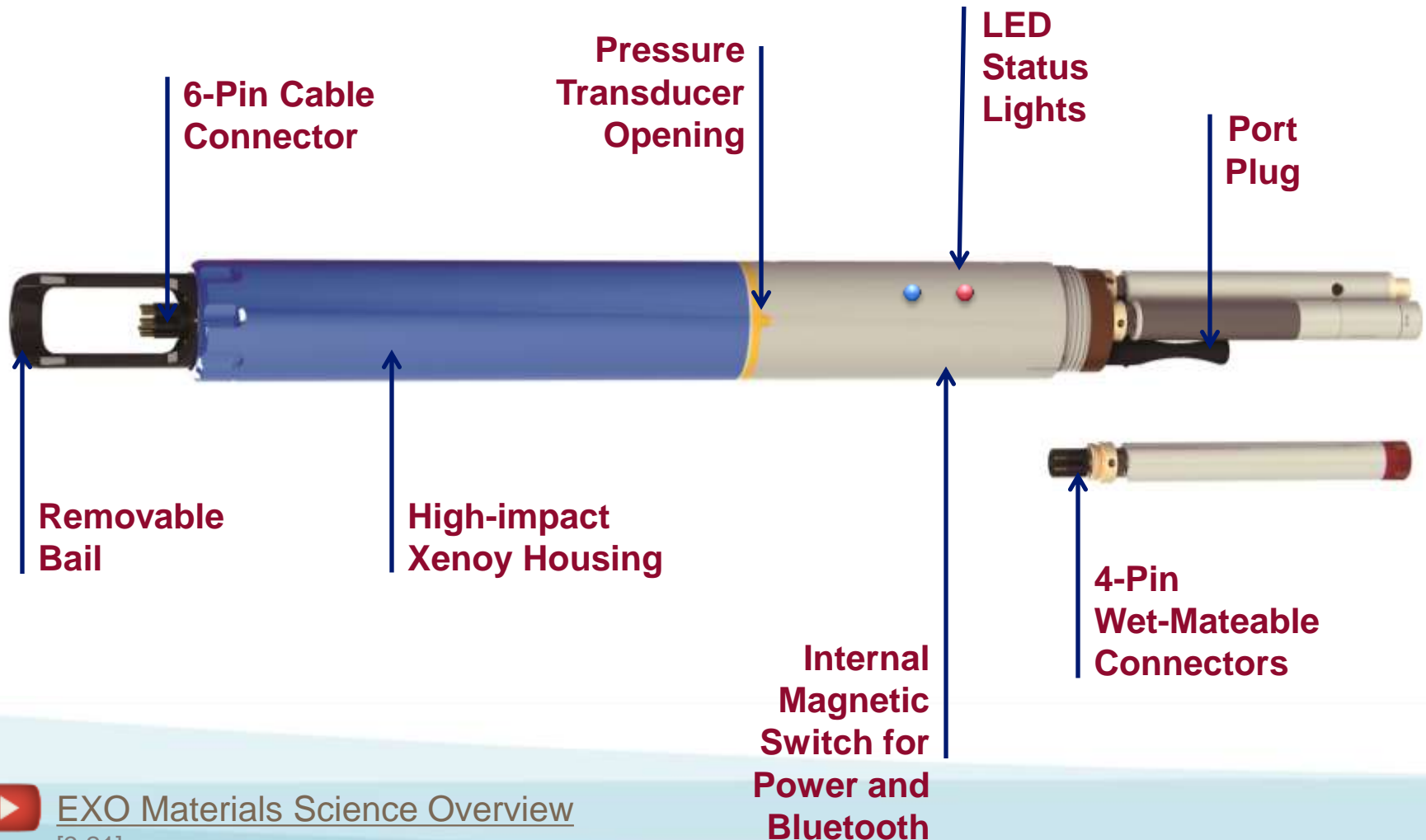




breaking the SONDE barrier

EXO1 Anatomy

EXOwater.com





breaking the SONDE barrier

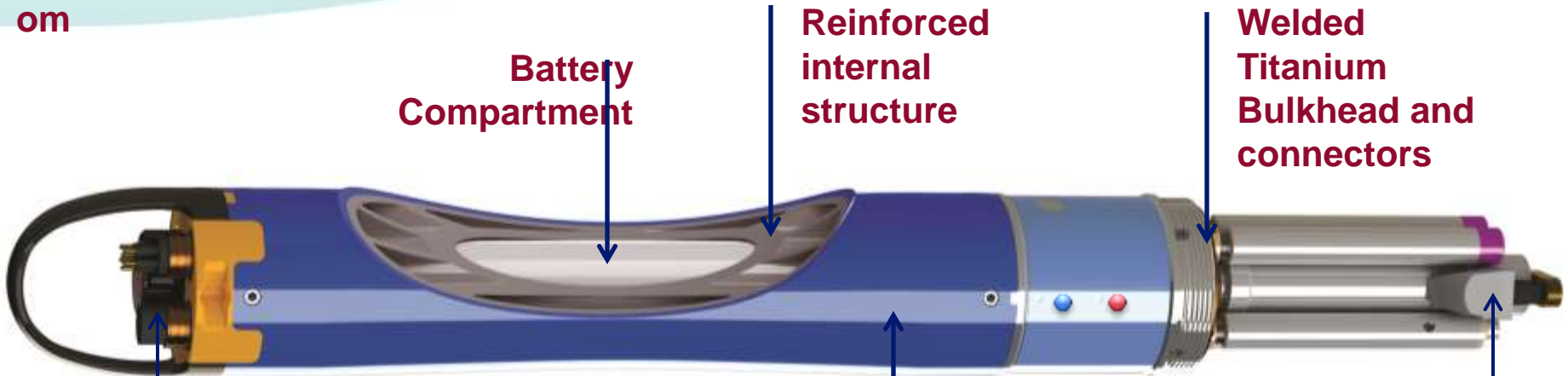
EXO2 Anatomy

EXOwater.com

Battery Compartment

Reinforced internal structure

Welded Titanium Bulkhead and connectors



Cable connector, battery valve, and expansion port for an additional sensor

High-impact Xenoy Housing



Anti-fouling wiper keeps sensors clear of biofouling and lengthens deployment times by 25%



breaking the SONDE barrier

EXO's Capabilities

EXOwater.com



Smart Ports

- Any Sensor – Any Port
- Sensor Auto-detection
- Customize the payload for *your* application
- AC Capacitive Coupling (protects electrical circuitry from shorting out)



[EXO Smart Ports – Smart Sensors](#)

[1:46]



SmartQC



Features You'll Find Only with EXO



Assisted Calibration

Graphical KOR software speeds the calibration process while reducing reagent consumption



Auto-recognition

and set-up of all sensors with background data routing



Titanium Sensors

with wet-mateable connectors and welded seals for deeper depths



Cable-free Operation

through the use of wireless communications



Biofouling Protection

with copper-alloy components and anti-fouling wipers



SmartQC

Smart QC

Automatically checks for faults and errors to ensure successful deployments



breaking the SONDE barrier

EXO Smart Sensors

EXOwater.com



Conductivity and Temperature

- Improved Temp. accuracy and response
- Improved Conductivity range
- Required for all monitoring applications



Total Algae

- Two sensors in one
- Chlorophyll + BGA-PC or PE



Turbidity

- Increased range without loss of accuracy



Smart Wiper System

- For use with EXO2 platform
- Superior anti-fouling
- Faster sampling response



[EXO Smart Ports – Smart Sensors](#)

[1:46]



breaking the SONDE barrier

EXO Smart Sensors

EXOWater.com



Ph + ORP

- Removable probe head
- Guarded and Unguarded versions



Fluorescent Dissolved Organic Matter (fDOM)

- New for YSI



Ion Selective Electrode

- Replaceable module
- Ammonium, Chloride, Nitrate



Optical Dissolved Oxygen

- Improved accuracy above 200%
- Faster response
- Screw-on membrane



[Replacing pH/ORP Sensor Module](#)

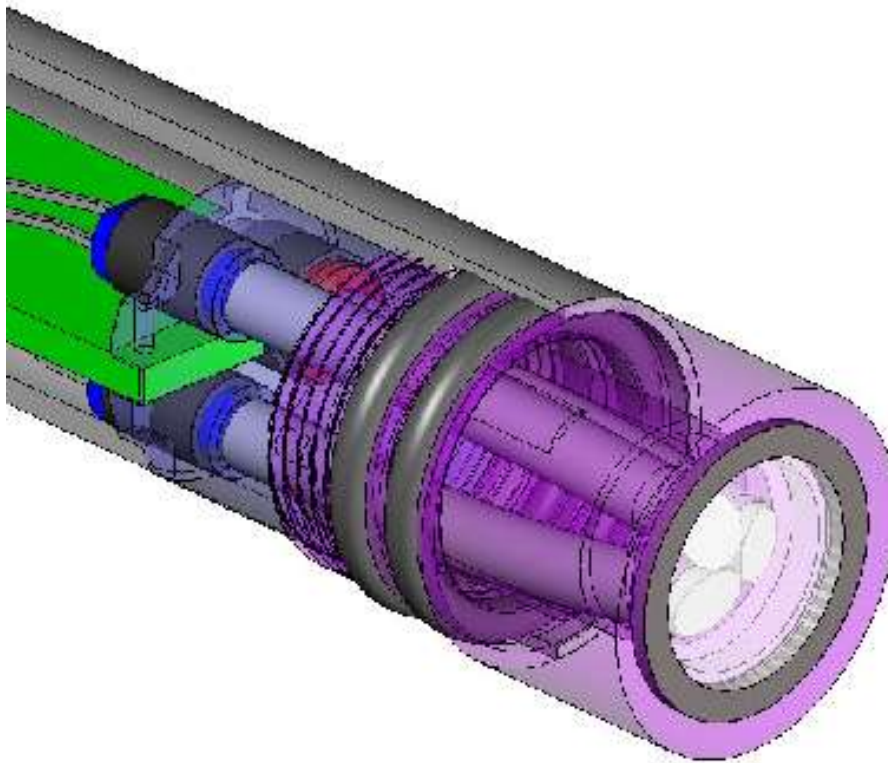
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[Replacing ODO Sensor Cap](#)

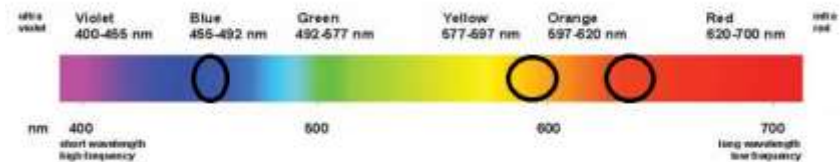
[1:46]

Total Algae Probe (Chl + BGA-PC)



Performance Benefits of Total Algae

- Two sensors in one
- **Senses viable cells only**, insensitive to degraded pigments
- More accurate estimate of total algae biomass by addressing underestimate issue with CHL sensors when cyanobacteria are present
- Discriminates between cyanobacteria and other types of algae
- Significantly **less sensitive to common interferences** (turbidity, fDOM, degraded pigments) due to narrow bandpass optics
- Lower detection limits
- Faster response
- Deeper depth rating



Easy calibration in lab



- Calibrate multiple sensors of the same type on one sonde
- Guided calibration procedure
- Software informs user when sensor is stable
- Wireless communication (Bluetooth)

EXO2 Central Wiper







breaking the SONDE barrier

EXO Handheld

EXOWater.com

- Full-Color LCD
- Bluetooth, USB & GPS
- Wet-Mateable Connector
- Barometer
- IP-67 Housing
- Windows CE 5.0
- KOR Software



KOR



Rechargeable Li-Ion Battery Pack

[4:14]



breaking the SONDE barrier

Accessories

EXOWater.com



Field cables



USB Signal Output Adapter



DCP (SDI-12) Signal Output Adapter



Multiple carrying case options



Lithium-Ion Battery pack

Other accessories:

- Storm3 Data Logger
- Anti-fouling sensor guards
- Flow cells



[EXO Accessories List](#)



[EXO Full Parts List](#)



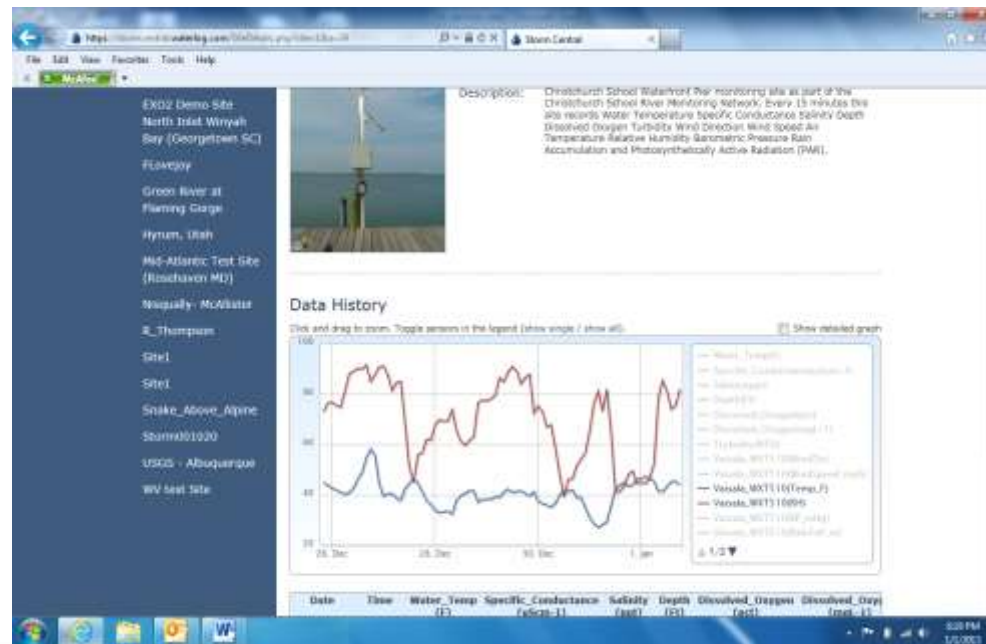
[Field Survival Guide](#)
[2:07]

Ease-of-Use = Time Saved

- Sonde automatically recognizes sensors
- Calibrate multiple sensors in one sonde and use in other sondes
- Bluetooth wireless communication reduces cables in the lab
- Indicator LEDs on sonde confirm health and state
- Magnetic control for Bluetooth



Real-Time Data Delivery





- Real-time data is viewable on any internet-connected device
- Data can also be sent to SCADA system



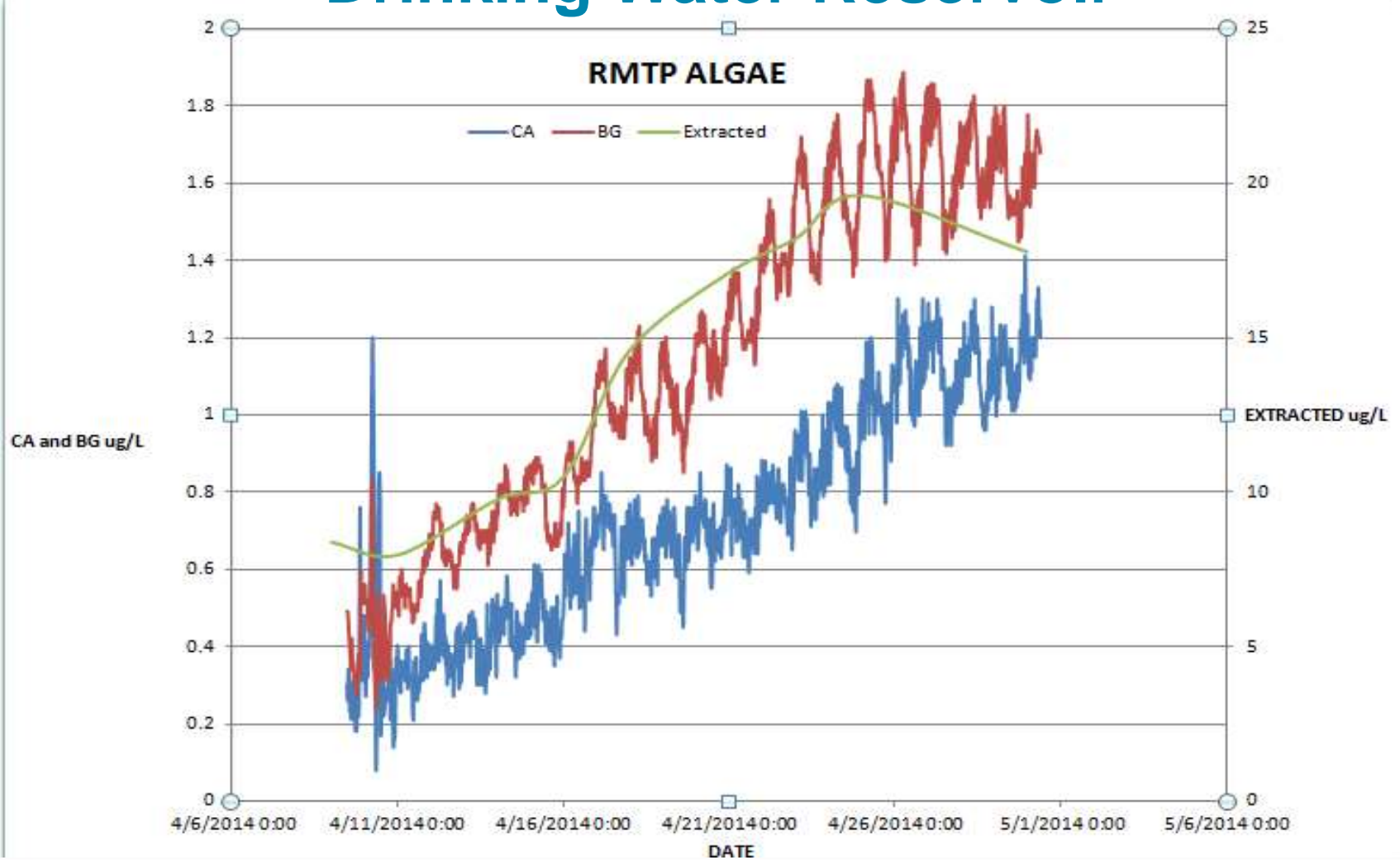
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Applications

The Places You'll Go with EXO



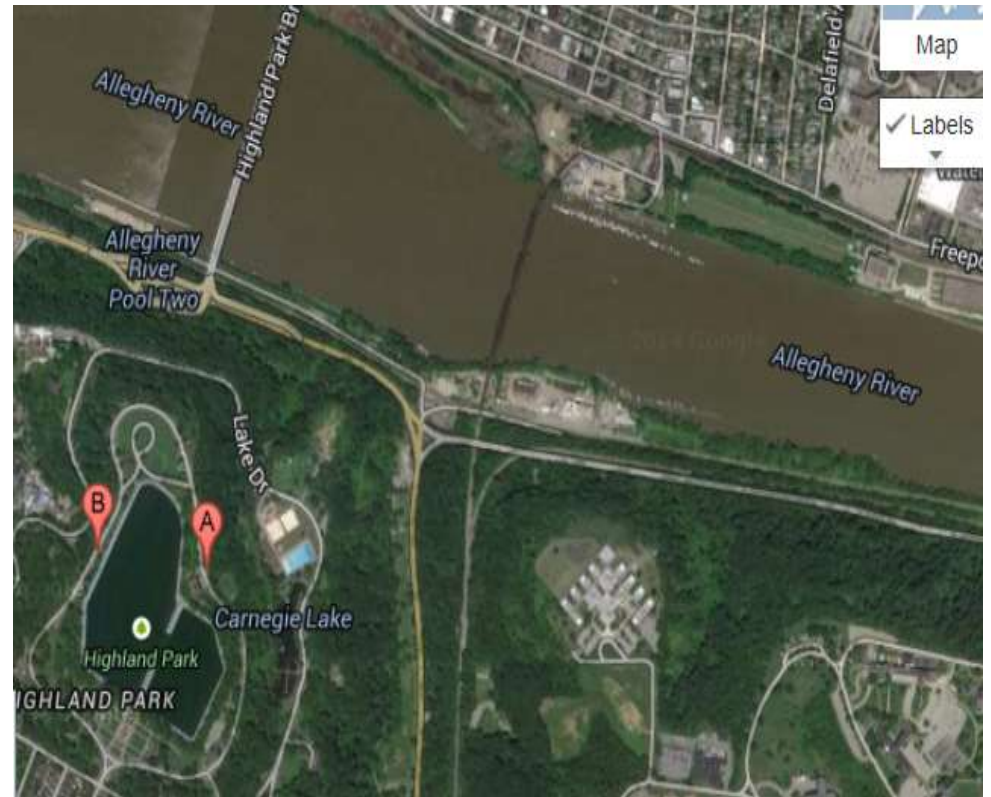
Cincinnati, OH Drinking Water Reservoir



Pittsburgh Drinking Water



Pittsburgh Drinking Water



Toledo and the Western Basin



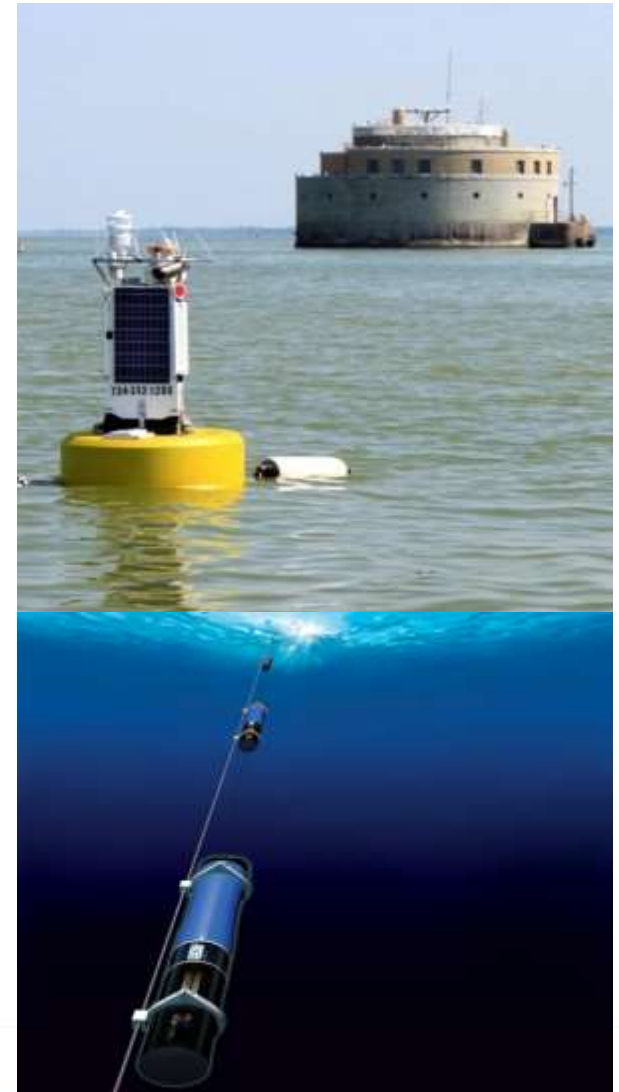
Toledo and the Western Basin

Toledo Buoy

- (2) EXO2 sondes mounted at different depths (water temperature, conductivity, pH, ORP, TDS, turbidity, total algae (blue-green algae and chlorophyll)).
- Water current and direction
- Wind speed, barometric pressure, rainfall
- Video camera

Sondes also mounted inside drinking water crib

Data transmission provides real time monitoring for many partners



New York City



New York City





Water Monitoring and Sampling Experts



AVAILABLE NOW

EXO UNIVERSITY an online training portal of self-guided lessons for getting the most out of your EXO platform.

- FREE to enroll

Going live – FALL 2014

Why EXO?

- Versatile instrument that can be used in a variety of applications
- Reduced operating costs
- Invest in a platform suitable for changing needs
- Durability/ease of use



[EXO Smart Ports – Smart Sensors](#)
[1:46]





breaking the SONDE barrier

EXO

Advanced Water Quality Monitoring Platform

EXOWater.com

Kyle Kaminski
kkaminski@ysi.com
937-776-8611

Chris Hess
chess@ysi.com
937-206-7829

